The Farming for a Better Climate (FFBC) newsletter keeps you up to date with some of the tips and ideas we are exploring with other farmers and through Scotland’s Farm Advisory Service (FAS) to help improve farm efficiency and profitability and reduce Scottish agriculture’s carbon footprint.

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What's been happening?

The switch from Brexit dominating the headlines to the unscripted global challenge of Covid-19 has brought with it a new set of challenges for all of us. Although it might not always feel like it, challenges do bring opportunities, so now might be a good time to take stock and re-asses some routine activities. What measures could help you, could you use some support or can you offer additional help to a neighbour? We list some helpful resources later in the newsletter.

These factors aside, in this newsletter we take a look back over the winter months and visit some of the ideas behind the Soil Regenerative Agriculture (RA) Group, some of the questions the group would like to answer going forward and a selection of activities underway on three of the five farms working with us on RA techniques.

Alongside the Soils Group, we also take a look at some of the other activities we have been involved with across the country to help farmers who are looking to reduce their farm carbon footprint and help support Scotland’s efforts to combat climate change.

Read on to see how other farmers are tackling the climate change issue head on, cutting their carbon footprint and benefiting the farm business both financially and environmentally.
Soil Regenerative Agriculture Group; progress update

Working as a group, five farmers are aiming to find some answers to some challenging questions.

Do we know how much better our soils could perform? What impact could this have on workability, establishment, disease resistance, yield and farm profits? How do we protect, improve and support our farm soils so as they are the best they can be? These are some of the thoughts that are taxing the Soils Group, and things they are looking to answer.

Regenerative agriculture (RA), working with natural biological systems to solve many common problems on a farm is often also cited as a solution for securing food production while promoting better soil health, biodiversity, nutrient cycling and water filtration. Sounds great, but how can we make this work in a changeable and often challenging Scottish climate?

With help from a range of industry specialists, a group of farmers under the Farming for a Better Climate initiative is looking at how we can solve common soil issues on five farms in the East of Scotland. The group aims to maintain crop outputs while reducing fertiliser and chemical inputs and reduce fixed costs, sharing information with other interested farmers as they go. Their ultimate goal is to improve and enhance farm soils. You can keep up to date with their findings via our website and social media pages.

Read on for some of the activities that have been happening on three of the five farms. We will catch up with Douglas Ruxton and James Hopkinson in the next newsletter.

Altering inputs to maximise yield

How do we target and reduce chemical use, but still support yields? That was one of the issues the group have been looking into. Reducing inputs can provide problems when planning to balance maximum crop production with maintained soil nutrient status. Ben Barron at Leifie Farms is approaching this by using small but regular foliar feeds to maximise nutrient uptake. Ben says, “My aim is to apply 50% less nutrients in a more accurate way to reduce waste and costs. We aren’t sure how long it will take to reach this goal; but we are moving in the right direction.” The group is also trialling areas of reduced chemical applications this season to compare with standard spray programs.

What is ‘regenerative agriculture’?

Regenerative agriculture (also referred to as conservation agriculture or ecological farming), is an approach centred around improving and revitalising soil health. The group are focusing their work around the following principles:

1. Minimise soil disturbance - help support a healthy soil food web.
2. Maximise crop diversity - different crops bring different rooting depths and attributes, supporting a range of biodiversity both above and below ground.
3. Provide constant soil cover - protect soils from wind and water erosion; reduces water loss.
4. Keep a living root in the system - root exudates benefit microbial populations, supporting soil health.
5. Integration of livestock - promoting species diversity from microbes to mammals and putting dung back into the system.

The key will be working out how we can integrate these five principles into a profitable business in Scotland.

Do you have experience of regenerative agricultural techniques you would like to share, or something you would like us to investigate?

We’d love to hear from you. Get in touch via social media or email us at climatechange@sac.co.uk
Planning for potatoes

Fitting root crops into a rotation while minimising soil disturbance is a significant challenge for any farmer. Destoning practices, pesticide use and wet weather conditions around harvest time can all have an impact soil health. Potatoes in particular can offer competitive seasonal rents, however this financial gain can often be offset by lasting soil damage.

Hugh Black at Backboath Farm grows potatoes and is one of the farmers in the Soils Group. With the knowledge that crops which put the most stress on farm soils often require you to work harder to promote soil health during the rest of the rotation, Hugh has been questioning some of his routine activities and considering why he is carrying out particular operations. Hugh says, “It is easier to realise the needs of the land when you are working it. Being part of this group has made decision making easier knowing that strange ideas can actually work” Hugh adds “Being adaptive to the ground conditions is a key part of regenerative agriculture and planning systems months in advance doesn’t always work in the real world”.

Direct drilling at Leitfie Farms

Ben Barron at Leitfie, one of the farmers in the Soils Group, has moved to direct drilling and is now in his fifth season using this system and through trial and error, has learned a lot of lessons along the way. For Ben, he is now seeing the benefits of this approach, with increased numbers of earthworms and soil structure is gradually beginning to show a notable improvement.

Direct drilling can be a low cost method of establishing crops which has a lower impact on the soil when compared with inversion tillage. However a lot is still to be learned about direct drilling in Scotland; direct drilling is still considered a higher risk when establishing crops than traditional plough and cultivation methods. Some of the biggest challenges include controlling slugs and obtaining an even and consistent crop emergence.

Ben and the other Soils Group members are looking to find a practical system to establish crops which has a low impact on soil health but is also considered to be low risk (i.e. reduced crop failures). The system needs to be resilient both in terms of finances and changing weather conditions, the past couple of years have seen both extreme wet and extreme dry and droughty conditions for farmers to cope with.

We will hear more about some of the other techniques being explored in the group in the next newsletter.

Keeping a root in the ground

As part of the Soils Group, two systems they are looking at are:

- Companion cropping – growing another crop or plant alongside the cash crop which can remain growing once the cash crop is harvested (e.g. growing winter oilseed rape with an understory of clover)
- Cover crop mixes between cash crops – establish a cover crop after harvest.

Establishment systems, timings, suitable species, grazing and desiccation are all under the spotlight.
Establishing cover crops

With a short growing season, early establishment gives a welcome head start.

Cover crops provide species diversity, help to fix nutrients and contribute organic matter to the soil. With the right mixture, the soil protection offered by cover crops can also help to reduce wind and rain erosion throughout the winter, but it is common in Scotland for cover crops to fail to produce any significant quantity of biomass – above or below ground.

Ross Mitchell from Castleton Farm has been looking at various methods of establishing green cover crops in autumn 2019. Using a mix of mustard, raddish, vetch and rye, Ross tried three different methods of establishment:

1. Establish the crop using the direct drill to drill the green cover mix straight into the stubble after harvesting spring barley.
2. Broadcast the green cover crop onto the stubble, followed with a straw rake (same day as method one)
3. Broadcast the green cover crop into the standing spring barley crop two weeks before harvest.

In all three trials, the straw from the previous crop was chopped and the green cover crops received 25 kgs/ha of Nitrogen to aid the breakdown of the straw and help establishment of the green cover crops. A dressing of slug pellets was also made to all three trials.

The photos, taken during a wet autumn in November 2019, show that the broadcast cover crops have established much better than the drilled cover crops.

Getting the cover crop established a fortnight before harvest allows for at least two weeks additional growth, maybe even three weeks by the time you can get the cover crop sown after harvest, at a very growthy time of year in August giving the cover crop a welcome head start.

Nature of Scotland Awards

The ninth annual Nature of Scotland Awards are now open for nominations. Entries are being sought in nine categories including Forest and Woodland and Nature and Climate Action.

Previous Climate Change Focus Farmer Bob Simpson at Castlemains received a ‘Highly Commended’ award in the Food and Farming category in 2017 for his work to improve biodiversity and mitigate climate change. Find out more and submit via rspb.org.uk/natureofscotland. Closing date 1st June 2020.
Top tips for calving

Robert Ramsay, Senior Consultant with SAC Consulting's Beef and Sheep Team shares some practical ideas at calving time.

With most of the suckler cows in Scotland calving in the spring, now is a timely opportunity to highlight some top tips for calving which will pay dividends in the long run.

• **Fail to prepare and prepare to fail.** Go through your calving kit and make sure you have everything you need. Think about all the eventualities, from iodine for navels, new calving ropes, lubricant, antibiotic, anti-inflammatories… the list goes on. A couple of hours spent sorting things out now will be greatly appreciated when you are in the thick of it.

• **Consider investing in a calving camera.** With less labour available on farms, many farmers have invested in a simple Wi-Fi or 4G calving camera which means that cows can be monitored remotely. This technology is well proven and is easily installed. A calving camera can be picked up for just a few hundred pounds and will pay for itself in its first year.

• **Colostrum is vital.** Calves need colostrum as soon as possible after birth. While most calves born naturally will get up and suckle, those born with assistance or via a difficult calving are far less likely to consume adequate colostrum in the first few hours of life. Although easy to use, powdered colostrum contains fewer antibodies than fresh colostrum and should only really be used as a last resort. Taking time to draw colostrum off the cow is always the best option, provided you can do so safely.

• **Keep a record of your losses.** Even the most optimistic farmer knows that there are likely to be losses. Recording losses allows you to highlight issues and have good discussions with your vet, how many cows aborted, how many still births, how many neonatal losses did you have? Vital information which can be used to save calves in the future.

• **Take care of yourself.** As an industry we have an unacceptable record when it comes to health and safety, with calving cows often highlighted as a particularly risky task. While we strive to save as many calves as we can, no calf’s life is worth more than yours. Don’t take unnecessary risks.

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**Bringing livestock back into the arable system**

In these days of climate change and methane emissions from ruminants, it may seem at odds to suggest bringing livestock back onto more farms, but there could be numerous benefits.

Market forces have steered us towards concentrating on a small area of production, specialising in this and doing it well. However there is a school of thought that suggests we should be going back to basics, and including livestock within the arable rotation.

This could be great news from a soil perspective if managed well. Having livestock grazing around the entire farm at some point in the year will help to put some much needed biology back into the soil. But aside from basic infrastructure items such as fences and water troughs, how might this work in practice? One option is to direct drill autumn sown crops earlier than we would under a plough based system and then graze the more advanced crops sometime between late autumn and spring to hold the crops back, remove diseased leaf material and provide a small amount of dung as well as stimulating soil mineralisation through the trampling effect. Likewise grazing of cover crops or crop residues with an understory of clover after harvest could take place.
Improving calf productivity

Calves get the benefit from calf jackets

Calf jackets are a great way to keep calves warm, meaning more energy is used for growth and to fight infection. Calves under one month of age will benefit the most. New-born calves do not have adequate fat reserves to help regulate body temperature and their high surface area to body size means they lose heat quickly in cold temperatures. Tips for using calf jackets:

- Make sure the calves’ coats are completely dry before fitting a jacket.
- Ensure the straps do not rub and adjust for growth as calves get bigger.
- Between calves, disinfect jackets with a licensed product for cryptosporidium, then wash at 60°C to kill cryptosporidium eggs.
- If jackets become wet, change them so the calf does not chill. Also ensure calves are not sweating under their jackets, again leading to chilling at night-time. Remove during the day if sweating, then replace at night.
- Remove jackets in the morning and not later in the day.

There's also a handy video on calf care in cold weather on the FAS website here.

Sustainable dairy group

Taking a detailed look at the farm business

Fifteen like-minded dairy farmers in Wigtownshire were keen to form a group to focus on how best to manage their farms to improve the sustainability of their dairy businesses going forward.

Should they be focusing on doing different things, going back to basics, embracing new technology or looking for ways to protect and enhance the environment on their farm in the face of a changing climate? Through Scotland's Farm Advisory Service (FAS), we helped the group of farmers in the first year of this project to see what practical things they, and other dairy units, could consider to increase their business resilience and improve their environmental performance.

Some of the topics the group covered included:

- Calving pattern - the group had a mixed calving pattern, from low input spring block calving to intensively managed high yielding cows calving all year round. They discussed the pros and cons of moving from an all year round to a block calving pattern
- Fertility - calving interval, heat detection and pregnancy rate were all explored.
- Making maximum milk from forage - what's the quality of forage available and can you reduce purchased feed and improve the sustainability of the business?
- Carbon footprinting - the group saw this as another way to compare their businesses and highlight areas where they were performing better or worse than other similar farms.

You can read more about the findings from the group via the Discussions Groups tab on the FAS page; information on Agrecalc is at www.agrecalc.com
Reaching ‘net-zero’
What does this mean for farmers?

We are hearing lots of talk on how farmers can achieve “net-zero greenhouse gas emissions” but what could this mean and how could it be achieved in practice?

At the individual farm level, if we maintain a headage of ruminant livestock (e.g. cattle, sheep) even at a reduced stocking rate, there will be associated methane emissions. However, there are things we can do to improve the picture and balance (or ‘offset’) these emissions with sequestration elsewhere on the farm.

Firstly, it’s a case of making sure all livestock are operating at peak performance; so livestock health, fertility and feed are areas to review. Inclusion of clover, improved use of slurry and dung, soil testing and targeted nutrient use are other ways you can look to improve farm efficiency. Depending on your energy demand, renewables could also help here, reducing the need for fossil fuels and using a cleaner energy source. A carbon footprint gives you another way to look at your business and will help you compare your emissions with other similar enterprises.

Alongside these mitigation measures, you could consider how you could sequester or lock up carbon on the farm. Most of these are slightly longer term measures, such as protecting and/or increasing soil organic matter content, hedgerow planting and woodland planting and management.

It’s not going to be easy for the sector to achieve a ‘zero carbon’ status, but we can certainly work towards this and build stronger, more resilient businesses going forward. For more information about how other farmers have taken practical steps to cut carbon and built efficiencies into their business, see the work carried out at the Climate Change Focus Farms and other case studies on our webpages.

More trees on farms?
Can woodland planting benefit your business?

Over 11,000 hectares of new planting was undertaken in Scotland in 2018, exceeding the current annual aspiration of around 10,000 new trees per year. Not only is this beneficial for locking in carbon, but there are also biodiversity and amenity benefits from planting the right species in the right places, increasing Scotland’s tree cover.

Could you benefit from including a few more trees on your farm? For example, shelterbelts provide well-known benefits, both for livestock and arable growers. They can help disrupt and reduce wind speed, protecting top soils from wind erosion following ploughing and help to reduce runoff.

There’s more information in our practical guides and some useful videos on the FAS website about the benefits of including trees on your farm.
Habitat linkage and carbon sinkage

Hedgerows provide more benefits than you might think.
Acting as wildlife corridors across a farm, hedgerows provide a relatively safe area for different bird, mammal and insect species to traverse the landscape, writes SAC Consultant Sarah Kerr. They enhance the natural capital and conservation value of a farm without compromising on productivity. Sequestering carbon, hedgerows can be a viable alternative to planted woodlands for farms to reduce their carbon footprint.

Hedges and hedgerow trees provide shelter and shade during extreme weather conditions e.g. heatwaves, storms and snow falls. Thick hedges provide biosecurity protection by preventing nose-to-nose contact and spread of transmittable livestock diseases e.g. IBR, TB.

Hedgerow margins are key overwintering habitats for a range of beneficial insects and pollinators. Integrated Pest Management (IPM) incorporates natural predatory insects that hunt down pests such as aphids, pollen beetles and slugs, preventing pest outbreaks and reducing pesticide reliance. Flowering plants are a vital food source and habitat for insect pollinators.

Fruiting plants provide a winter food source for birds. Restrictions on hedge management e.g. cutting and lopping activities from 1 March – 31 August, inclusive (unless exemptions apply) provide protection for breeding birds. Hedge laying can be carried out up to and including 31 March. Local government agricultural offices can provide regulatory details.

Cutting only one third of the hedge length annually leaves a winter food source for native farmland birds like Yellow Hammers, Linnet and Tree Sparrows. Trimming in an ‘A’ shape, wider at the bottom, ensures a denser wildlife corridor for mammals and improves light penetration to all parts of the plants, preventing thorn plants in particular, from dying out.

Whether planting a new hedge, or gapping up an existing one, using native flowering shrubs e.g. hawthorn, blackthorn, hazel, honeysuckle, crab apple or wild roses, will provide vital wildlife food and habitat resources. Late autumn and early spring are the ideal seasons for this work.

Weathering the extremes

Remember your five P’s - Prior Planning Prevents Poor Performance

Farmers have always worked with the weather, but it seems we are experiencing challenging conditions far more often, making things harder to plan for.

As part of the Farm Advisory Service (FAS), SAC Consultant Iain Boyd went over some tips and resources that could help us become more resilient when faced with stormy weather conditions. You can take a look at his videos on increased storminess and other useful topics via www.fas.scot on the FAS YouTube channel. You can also find information on adapting to a changing climate and what other farmers have done on our adaptation pages here.

Field drains

Worth checking serviceability

With the high rainfall most of us experienced throughout February and more localised, intense rainfall predicted as a feature of climate change, it would be worth checking that field drains are running and serviceable. Iron ochre, an orange slime, which coats the inside of drainage pipes is can be a problem for organic soils. It will block pipes if not controlled by regular jetting of the drainage system. There’s more info in the Valuing Your Soils booklet, available on our soils, fertilisers and manures page.
COP26; UN Climate Change Conference

At time of writing, the 26th United Nations Conference of the Parties (COP26) focusing on climate change due to take place in Glasgow in November 2020 has been postponed. This would have been the biggest gathering of world leaders the UK has seen since the 2012 London Olympic Games.

The annual conference attracts delegates from all around the world looking to agree a strategic approach to reducing global greenhouse gas emissions and meeting the targets agreed in the Paris agreement in 2016. The Paris Agreement aimed to contain global temperature rise to well below 2°C above pre-industrial levels, an ambitious target that would require a great shift in the way we currently produce and consume food. As other industries such as transport and energy continue to become more efficient, agriculture becomes more and more visible in terms of emissions, but importantly, is also seen as a key player in emissions reduction with scope for locking carbon into the farm (often referred to as carbon sequestration) alongside food production.

The wider public are becoming far more aware of the links between food and climate and therefore agriculture has become important to the public in the fight against climate change. Even in the absence of COP26, we can still continue to demonstrate how farmers across Scotland are improving their efficiency and environmental credentials, showing the world how farming can be done in a productive but environmentally and carbon friendly manner.

Myth busting

SAC Consultant Zach Reilly shares some of the facts around climate change.

Auchineck Estates hosted a meeting of the FAS Soil and Nutrient Network back in October. Consultant Zach Reilly did some myth busting around climate change and went straight to the science looking at some of the facts we already know and how agriculture can be part of the solution.

Agro-forestry and improved cropland, livestock and grazing management are all measures we can consider to help reduce the impact of farming practices on the environment. Things like shelterbelts, managing existing woodland or planting new trees on the farm, making sure all livestock are healthy and performing to the best of their ability and taking account of nutrients in slurry and manure, were all things that could bring benefits to both the climate and the farm business. If you want a quick refresher, you can view his slides here or via the FAS website.

How are other farmers tackling climate change?

Hints, tips and ideas from other farmers on our webpages.

If you haven’t been on our website yet, there are a number of short videos recorded on the Climate Change Focus Farms about some of the changes the hosts have put in place or are considering to benefit their business, and you can listen to some of the areas the farmers in the Soils Group are looking to focus on.

If you would prefer a bit of light reading, there are over 200 easy to read documents ranging from ideas explored at the focus farm discussion group meetings, to practical guides, to case studies showing what other farmers are doing to improve their efficiency and cut carbon. We are hoping to record a series of Podcasts going forward too; keep an eye on our social media feeds for more information.
Seeking help and helping others

Lastly, at time of writing, we are still in a lockdown situation with no scope of restrictions lifting any time soon. Don’t be afraid to make early contact with other organisations that could help you. Sharing your knowledge and experience could also help others too. New information and resources are being developed on a daily basis as more of the impacts on the sector become clear. A few good starting places include:

- **FAS website** - From emergency planning to keeping children safe on farm, the FAS webpages host a range of practical advice. Phone 0300 323 0161 or email advice@fas.scot
- **NFU Scotland** - Host of useful pages on COVID19 ranging from employment opportunities on farms to Frequently Asked Questions (FAQs).
- **RSABI** - Providing emotional, practical and financial support to individuals and their families across the agricultural sector including farming and crofting. Number of useful resources on their pages (including the FarmWell document with host of additional contacts), plus a support helpline on 0300 111 4166.

Further information and contact details

You can read more about the Soil Regenerative Agriculture Farmers, previous work with the Climate Change Focus Farms and download practical guides and case studies at [www.farmingforabetterclimate.org](http://www.farmingforabetterclimate.org)

The Farm Advisory Service (FAS) also hosts a range of meetings and information which could help you to benefit from reducing the farm carbon footprint see [www.fas.scot](http://www.fas.scot).

Get in touch - contact one of the team:

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